

Patent
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REMARKS

Applicant hereby elects the subject matter of Claims 1-13 and 20-31 classified in class 313.

It is noted that the Examiner did not consider the Preliminary Amendment filed with the case setting forth the additional claims to remove multiple dependency. Enclosed herewith is a copy of the Preliminary Amendment.

If there are any questions with regards to this matter the undersigned attorney would appreciate a telephone conference.

I hereby certify that this correspondence is being transmitted via facsimile to the USPTO at 571-273-8300 on April 27, 2006.

Very truly yours,


SNELL & WILMER L.L.P.

By: Sharon Farnus

Sharon Farnus

Signature

Dated: April 27, 2006



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COPY

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Takehiro Zukawa et al.

Serial No.:

Filed: Herewith

For: LIGHT EMITTING DEVICES
HAVING A SELF-CLEANING
FUNCTION, METHODS OF
MANUFACTURING THE SAME,
AND METHODS OF
MANUFACTURING PLASMA
DISPLAY PANELS HAVING A
SELF-CLEANING FUNCTION

Patent Examiner:

Group Art Unit:

November 13, 2003

Irvine, California 92614

PRELIMINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sirs:

Prior to an examination on the merits of the above-identified application, please enter the following.

PRICE/URVJ40760.1

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IN THE CLAIMS:

1. (Original) A light emitting device that emits visible light caused by an ultraviolet ray from a discharge generated in a discharge medium including a rare gas, the light emitting device comprising:

a vessel that is hermetically sealed and contains the discharge medium;

a phosphorous material disposed in the vessel; and

one or more photocatalysts that (i) are disposed at one or more first areas inside the vessel, the first areas being reachable for one or both of the ultraviolet ray and light emitted from the phosphorous material, and (ii) are in contact with the discharge medium.

2. (Original) The light emitting device of Claim 1, wherein

the light emitting device is a plasma display panel,

the vessel is made of at least a first substrate and a second substrate that oppose each other and are sealed together around edges thereof,

a plurality of ribs are formed on the first substrate,

in each of at least one of second areas provided between the ribs, the phosphorous material forms one or more phosphor layers on one or more walls that surround the second area, and

at least one of the photocatalysts is disposed at one or more positions selected from (i) anywhere in the second area in which the phosphor layer is formed and (ii) at a top of at least one of the ribs that sandwich the second area in which the phosphor layer is formed.

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3. (Original) The light emitting device of Claim 2, wherein
at least one of the photocatalysts is disposed so as to be distributed throughout one
or more of the phosphor layers.

4. (Original) The light emitting device of Claim 2, wherein
the phosphor layers are porous so as to allow the discharge medium to pass
through, and
at least one of the photocatalysts is disposed so as to be (i) positioned between at
least one of the phosphor layers and the first substrate, and (ii) in contact with the at least one of
the phosphor layers.

5. (Original) The light emitting device of Claim 2, wherein
the phosphor layers are porous so as to allow the discharge medium to pass
through, and
at least one of the photocatalysts is disposed so as to be (i) positioned between at
least one of the ribs and the phosphor layer formed over a surface thereof, and (ii) in contact with
this phosphor layer.

6. (Original) The light emitting device of Claim 2, wherein
at least one of the photocatalysts is disposed at one or more positions selected
from (i) at a top of at least one of the ribs and (ii) in vicinity of such a top.

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7. (Currently Amended) The light emitting device of ~~any of Claims Claim 3, 4, 5,~~
~~and 6,~~ wherein

when absorbing an ultraviolet ray, each phosphor layer emits light in a color that
is common to the phosphor layers in that second area, the color being one of red, green, and blue,
and

at least one of the photocatalysts has an absorption edge within a wavelength band
of the color of blue in a visible light range and is disposed in vicinity of the phosphor layer that
emits light in the color of blue.

8. (Currently Amended) The light emitting device of ~~any of Claims Claim 3, 4, 5,~~
~~and 6,~~ wherein

when absorbing an ultraviolet ray, each phosphor layer emits light in a color that
is common to the phosphor layers in that second area, the color being one of red, green, and blue,

the photocatalysts each have an absorption edge in one of two or more
wavelength bands that are different from each other, and

which wavelength band the absorption edge of each photocatalyst is within is
determined according to the color of the light emitted from the phosphor layer that is disposed in
vicinity thereof.

9. (Currently Amended) The light emitting device of ~~any of Claims Claim 3, 4, 5,~~
~~and 6,~~ wherein

all the second areas each have at least one of the photocatalysts disposed therein.

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10. (Currently Amended) The light emitting device of ~~any of Claims~~ Claim 3, 4, 5,
~~and 6,~~ wherein
a main component of each of the photocatalysts is TiO_2 in anatase form.
11. (Original) The light emitting device of Claim 10, wherein
at least one of the photocatalysts has an absorption edge within a visible light
range.
12. (Original) The light emitting device of Claim 1, wherein
the light emitting device is a plasma display panel,
the vessel is made of at least a first substrate and a second substrate that oppose
each other and are sealed together around edges thereof, and
the one or more photocatalysts are disposed outside an image display area in
which the phosphorous material is disposed.
13. (Original) The light emitting device of Claim 12, wherein
the photocatalysts are disposed in vicinity of the edges of at least one of the first
and the second substrates.
14. (Original) A method of manufacturing a light emitting device that emits visible
light caused by an ultraviolet ray from a discharge generated in a discharge medium including a
rare gas, the method comprising:
a precursor preparing step of preparing a precursor of a phosphor layer by mixing
phosphor particles and a photocatalyst;

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a precursor disposing step of disposing the precursor at one or more positions being reachable for the ultraviolet ray, so that the precursor is in contact with the discharge medium; and

a phosphor layer forming step of forming a phosphor layer by baking the precursor.

15. (Original) A method of manufacturing a light emitting device that emits visible light caused by an ultraviolet ray from a discharge generated in a discharge medium including a rare gas, the method comprising:

a phosphorous material disposing step of disposing a phosphorous material at one or more positions being reachable for the ultraviolet ray; and

a photocatalyst disposing step of disposing a photocatalyst at one or more positions being reachable for one or both of the ultraviolet ray and light emitted from the phosphorous material, so that the photocatalyst is in contact with the discharge medium.

16. (Currently Amended) The method of ~~any of Claims~~ Claim 14 and 15, wherein a nitriding process is performed on the photocatalyst in order to adjust an absorption edge of the photocatalyst.

17. (Original) A method of manufacturing a plasma display panel in which a first substrate and a second substrate oppose each other and are sealed together around edges thereof, the first substrate having a plurality of ribs formed thereon, the method comprising:

a mixture preparing step of preparing a mixture of phosphor particles and a photocatalyst;

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a precursor disposing step of disposing the mixture in at least one of areas provided between the ribs so as to form a precursor of a phosphor layer on one or more of walls that surround the area; and

a phosphor layer forming step of forming the phosphor layer by baking the precursor.

18. (Original) A method of manufacturing a plasma display panel in which a first substrate and a second substrate oppose each other and are sealed together around edges thereof, the first substrate having a plurality of ribs formed thereon, the method comprising:

a phosphorous material disposing step of disposing a phosphorous material at one or more positions being reachable for an ultraviolet ray; and

a photocatalyst disposing step of disposing a photocatalyst at one or more positions on at least one of the first substrate and the second substrate, the positions being reachable for one or both of the ultraviolet ray and light emitted from the phosphorous material, so that the photocatalyst is in contact with a discharge medium in the plasma display panel.

19. (Currently Amended) The method of ~~any of Claims~~ Claim 17 and 18, wherein a nitriding process is performed on the photocatalyst.

20. (New) The light emitting device of Claim 4, wherein when absorbing an ultraviolet ray, each phosphor layer emits light in a color that is common to the phosphor layers in that second area, the color being one of red, green, and blue, and

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at least one of the photocatalysts has an absorption edge within a wavelength band of the color of blue in a visible light range and is disposed in vicinity of the phosphor layer that emits light in the color of blue.

21. (New) The light emitting device of Claim 5, wherein

when absorbing an ultraviolet ray, each phosphor layer emits light in a color that is common to the phosphor layers in that second area, the color being one of red, green, and blue, and

at least one of the photocatalysts has an absorption edge within a wavelength band of the color of blue in a visible light range and is disposed in vicinity of the phosphor layer that emits light in the color of blue.

22. (New) The light emitting device of Claim 6, wherein

when absorbing an ultraviolet ray, each phosphor layer emits light in a color that is common to the phosphor layers in that second area, the color being one of red, green, and blue, and

at least one of the photocatalysts has an absorption edge within a wavelength band of the color of blue in a visible light range and is disposed in vicinity of the phosphor layer that emits light in the color of blue.

23. (New) The light emitting device of Claim 4, wherein

when absorbing an ultraviolet ray, each phosphor layer emits light in a color that is common to the phosphor layers in that second area, the color being one of red, green, and blue,

the photocatalysts each have an absorption edge in one of two or more wavelength bands that are different from each other, and

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which wavelength band the absorption edge of each photocatalyst is within is determined according to the color of the light emitted from the phosphor layer that is disposed in vicinity thereof.

24. (New) The light emitting device of Claim 5, wherein
when absorbing an ultraviolet ray, each phosphor layer emits light in a color that is common to the phosphor layers in that second area, the color being one of red, green, and blue,
the photocatalysts each have an absorption edge in one of two or more wavelength bands that are different from each other, and

which wavelength band the absorption edge of each photocatalyst is within is determined according to the color of the light emitted from the phosphor layer that is disposed in vicinity thereof.

25. (New) The light emitting device of Claim 6, wherein
when absorbing an ultraviolet ray, each phosphor layer emits light in a color that is common to the phosphor layers in that second area, the color being one of red, green, and blue,
the photocatalysts each have an absorption edge in one of two or more wavelength bands that are different from each other, and

which wavelength band the absorption edge of each photocatalyst is within is determined according to the color of the light emitted from the phosphor layer that is disposed in vicinity thereof.

26. (New) The light emitting device of Claim 4, wherein
all the second areas each have at least one of the photocatalysts disposed therein.

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27. (New) The light emitting device of Claim 5, wherein
all the second areas each have at least one of the photocatalysts disposed therein.
28. (New) The light emitting device of Claim 6, wherein
all the second areas each have at least one of the photocatalysts disposed therein.
29. (New) The light emitting device of Claim 4, wherein
a main component of each of the photocatalysts is TiO_2 in anatase form.
30. (New) The light emitting device of Claim 5, wherein
a main component of each of the photocatalysts is TiO_2 in anatase form.
31. (New) The light emitting device of Claim 6, wherein
a main component of each of the photocatalysts is TiO_2 in anatase form.
32. (New) The method of Claim 15, wherein
a nitriding process is performed on the photocatalyst in order to adjust an absorption edge
of the photocatalyst.
33. (New) The method of Claim 18, wherein
a nitriding process is performed on the photocatalyst.

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REMARKS

The newly proposed claims are within the scope of the present invention and do not add any new matter.

If the Examiner believes a telephone interview would help in the further prosecution in this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

Very truly yours,

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